

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1-19. (Canceled)

20. (New) A reactor for treating a viscous medium or for carrying out chemical reactions in viscous medium, said reactor comprising a vessel and a coil for circulation of a coolant fluid, said coil comprising at least one segment of tube wound along a helical generatrix, and at least a second segment of tube (512, 513) wound along a helical generatrix and extending in parallel to the first segment (511) between a distributor (53) and a manifold (54), said first and second segments being centred on the same geometrical axis (X_5), with substantially the same bending radius (R_1) and nested so that they together form a substantially cylindrical bundle (51).

21. (New) The reactor according to Claim 20, wherein the coil further comprises a second bundle (52) formed by at least one segment of tube (521, 522) wound along a helical generatrix, extending between said distributor (53) and said manifold (54) and centred on said axis (X_5), said second bundle being of substantially cylindrical shape, with a radius (R_2) smaller than the radius (R_1) of the first bundle (51).

22. (New) The reactor according to Claim 21, wherein said second bundle (52) is formed by at least two segments of tubes (521, 522) wound along helical generatrices, nested and extending in parallel between said distributor (53) and said manifold (54).

23. (New) The reactor according to Claim 20, wherein said first bundle (51) is formed by three segments of tube (511, 512, 513) wound along helical generatrices and nested.

24. (New) The reactor according to Claim 20, wherein said segments (511,

512, 513, 521, 522) have substantially the same length and/or induce substantially the same pressure drop on the flow of said coolant fluid, between said distributor (53) and said manifold (54).

25. (New) The reactor according to Claim 20, wherein the coil further comprises a tube (56) extending, in a direction substantially parallel to said axis (X_5), between said first (51) and second (52) bundles, said tube being connected either to said distributor (53) or to said manifold (54).

26. (New) The reactor according to Claim 25, wherein said distributor (53) and/or said manifold (54) are in the form of a torus and centred on said axis (X_5).

27. (New) The reactor according to Claim 26, wherein said distributor (53) and/or said manifold (54) are curved with a radius (R_3 , R_4) substantially equal to the radius (R_2) of said first bundle (51) or optionally of said second bundle (52), with the result that they are substantially in line with said first bundle or optionally with said second bundle.

28. (New) A method for manufacturing a reactor for treating a viscous medium or for carrying out chemical reactions in viscous medium, said reactor comprising a vessel and a coil comprising at least one segment of tube wound along a helical generatrix, said method comprising the step of interleaving (F_1 , F_2) said segment (511) with at least a second segment of tube (512, 513) wound along a helical generatrix with substantially the same bending radius (R_1) as the first segment, so as to form a substantially cylindrical bundle (51).

29. (New) A method according to Claim 28, wherein said segments are interleaved by a movement of screwing (F_1 , F_2) around a geometrical axis (X_5) common to said segments.

30. (New) A reactor according to Claim 20, further comprising an agitator (4) arranged around or inside said coil (5).

31. (New) A reactor according to Claim 30, wherein said agitator is suspended from the ceiling of said reactor (1) and forms a cage surrounding said coil (5), the supply and evacuation (56, 59, 61, 62) of the coolant fluid towards or from said coil being effected through the bottom (21) of said reactor.

32. (New) A reactor according to Claim 30, wherein said agitator is formed by an endless screw centred on the geometrical axis (X_5) of an inner bundle (52) or of the single bundle (51) of said coil (5).
33. (New) A reactor according to Claim 30, wherein the inner bundle (52) or the single bundle (51) of said coil forms a central well (P) of radius (R_2) included between 20 and 70% of the radius (R) of said vessel (2).
34. (New) A reactor according to Claim 33, wherein the inner bundle (52) of said coil forms a central well (P) of radius (R_2) included between 20 and 40% of said radius.
35. (New) A process for the treatment of a viscous medium comprising the step of treating said liquid in a reactor (1) as defined in Claim 20 and of volume (V) greater than about 8 m³.
36. (New) The process according to Claim 35, wherein said treatment is a reaction of polymerization.
37. (New) The process according to Claim 36, wherein the reaction is a discontinuous reaction of polymerization.
38. (New) The process according to Claim 38, wherein the reaction is a continuous reaction of polymerization.